Rooted plants move mysteriously down greenways, scientists say

December 3 2008

The wild pea pod is big and heavy, with seemingly little prayer of escaping the shade of its parent plant. And yet, like a grounded teenager who knows where the car keys are hidden, it manages – if it has a reasonable chance of escape.

University of Florida researchers working at the world's largest experimental landscape devoted to wildlife corridors – greenways that link woods or other natural areas — have discovered the pea and similar species share, given a clear shot, a mysterious ability for mobility. Though their seeds are neither dispersed by birds nor borne by the wind, they are nevertheless far more likely to slalom down corridors than slog through woods.

The findings are revealed in a paper that appears this week in the online edition of the *Proceedings of the National Academy of Sciences*.

"Corridors surprisingly benefit pretty much everything, including species that have no obvious mechanism for getting around in the first place," said Doug Levey, a UF professor of zoology and one of six authors of the paper.

Movement is a big challenge for the vast majority of plants, rooted as they are in the ground. Some overcome it by making seeds gobbled by birds, then defecated at points unknown. Other plants have evolved light seeds, or aerodynamically adept ones, designed to be ferried hither and thither in the wind.

But many plants produce seeds with no seeming mode of transport, suggesting, for those species, a measured march rather than a rapid run.

And yet …

Levey and colleagues at Washington University in St. Louis and North Carolina State University have spent the past eight years studying how corridors affect plants and animals at a massive experimental site at the Savannah River Site National Environmental Research Park on the South Carolina-Georgia state line.

In past papers, they have reported that corridors appear to help both wildlife and plants, especially native species. Those findings are among the most rigorous scientific validations of the national and state trend toward spending public dollars on buying and preserving "green" corridors connecting woods or wetlands in urban or rural areas.

In the new paper, the researchers report the results of research aimed at learning how corridors affect plant species with innately different abilities to get around.

Perhaps unsurprisingly, the scientists found that wind-borne plants and bird-dispersed plants colonize wildlife habitats connected by corridors more quickly and at farther distances than they do isolated habitats. The surprise was that the same is true for what the scientists consider "unassisted" plants, or those with no obvious means of moving their seeds.

The result left the researchers puzzled. "We come right out and say in the paper that we don't understand this," Levey said.

Physical forces clearly aren't adequate to cause the phenomenon, the paper notes.

"Gravity dispersal from low-growing shrubs, forbs and grasses, which typically moves a seed no more than a few meters per year, cannot account for the rapid colonization of connected patches 150 meters distant," the paper says.

With no obvious alternative, Levey said one possible explanation is that the plants' seeds aren't as unassisted as they appear. For example, it's possible that herbivores eat the seeds, even if they are not recognized as normal forage. "My hunch is that these plants are browsed by deer that are really after the leaves," Levey said. "They eat the seeds along with the leaves, and then defecate the seeds somewhere else."

Perhaps improbably, given the randomness of deer defecation, the researchers are testing this hypothesis.

Caleb Hickman, a graduate student in the Washington University Ecology, Evolution, and Population Biology Program, has collected fecal samples left behind not only by deer, but also by a variety of mammals at Savannah River experimental sites.

He is planting the samples in soil in a Washington University greenhouse. The goal: to see if previously classified "unassisted" plant species seedlings emerge.

That would prove that like many teenagers, plants are much more creative about getting around than most people suspect.

Source: University of Florida

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